9-2011

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DOI: https://doi.org/10.1177/0148558X11421673

Published in Journal of Accounting, Auditing and Finance, 2011 September, Volume 28, Issue 1, Pages 20-52
http://doi.org/10.1177/0148558X11421673

The Role of Reputable Auditors and Underwriters in the Design of Bond Contracts

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Abstract

The authors empirically test the certification hypothesis by studying the roles of reputable auditors and bank underwriters in the design of bond contracts. The certification hypothesis suggests that reputable capital market intermediaries can credibly communicate inside information to outside investors, thereby helping improve financing terms for firms that raise external funding. Consistent with this hypothesis, the authors provide evidence that reputable auditors and underwriters help corporate bond issuers obtain lower bond yields. The effect of reputable auditors on the yields is greater than that of reputable underwriters in terms of economic magnitude and significance, consistent with auditors' multiple roles as information intermediaries, monitors, and insurance providers. The authors also find that the presence of reputable auditors and underwriters affects bonds' nonpricing terms. Firms that hire reputable auditors obtain longer term bonds, whereas those that engage reputable underwriters can issue larger bonds. Taken together, the results suggest that reputable auditors and underwriters have integral, but different, roles in the bond-issuing process.

Keywords

reputable auditor, reputable underwriter, bond terms, certification hypothesis

Several theoretical articles suggest that third-party information intermediaries can certify the quality of security-issuing firms that face significant information asymmetries in capital markets (i.e., the Certification Hypothesis). For instance, the models of DeAngelo (1981), Beatty and Ritter (1986), Booth and Smith (1986), and Titman and Trueman (1986) examine how bank underwriters and auditors help resolve information asymmetries of issuing firms. These theories argue that underwriters and auditors use their reputation capital as a bonding mechanism to credibly certify the information about the future prospects of the issuing firms, thereby helping improve firms' financing terms when raising external financing. In this article, we empirically investigate the certification hypothesis in the primary bond market by combining the role of auditors and underwriters. Specifically, we study the roles of reputable auditors and bank underwriters in the design of bond contracts.

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Auditors and underwriters are important information intermediaries in the bond market, a market that has received little attention so far despite the fact that it provides the most significant source of external financing to U.S. firms.[1] Auditors play a role in certifying that the accounting information provided in the bond prospectuses by issuing firms is accurate and prepared in accordance with Generally Accepted Accounting Principles. In addition to the certification function, auditors have a monitoring role, which they fulfill by reporting potential errors in financial statements and violations of covenants set in bond contracts. Auditors also bear legal liability for accounting irregularities that occur in the reports of the firms they audit and, under certain conditions, provide bond investors with a means to indemnify their losses (e.g., Dye, 1993; Mansi, Maxwell, & Miller, 2004).[2] These monitoring and insurance roles complement auditors' certification role and potentially make auditors more relevant information intermediaries to bondholders than underwriters. Although underwriters certify information about the future prospects of issuing firms and use their extensive distribution networks and selling expertise to help issuing firms place bond securities, their liability is limited to situations where negligence is proven. Hence, underwriters typically do not provide insurance against investment losses. Furthermore, they have a limited monitoring role after a bond is issued.[3]

High-quality bond issuers are likely to signal their type by seeking certification from reputable auditors and underwriters. Auditors and underwriters develop reputation capital by repeatedly entering into the market and providing credible information about the issuing firms. As a result, the value of their reputation capital likely exceeds even the largest possible one-time gain that could be obtained from certifying falsely. Rational investors should understand these incentives and thus provide capital under more favorable terms to the firms certified by intermediaries with reputation capital at stake.

To test these arguments in the bond market, we first construct reputation proxies for auditors and underwriters. We designate an auditor as a reputable auditor if its market share based on the clients' sales is the largest in the industry and outpaces the rest of auditors by at least 10% (Dunn & Mayhew, 2004; Palmrose, 1986). We define reputable auditors at the industry level because the prior literature shows that industry expertise possessed by auditors can affect managers' earnings management behavior and reduce information asymmetry between firms and investors (e.g., Almutairi, Dunn, & Skantz, 2009; Balsam, Krishnan, & Yang, 2003). As most issuers in the bond market hire large auditors, our focus is only on companies audited by the big four/five auditors. We define an underwriter as reputable if its market share, as captured by the bond volume advised in the whole bond market, persistently ranks among the top five underwriters in the past 3 years.

Consistent with the certification hypothesis, we find that hiring reputable auditors reduces bond issuance yields by 35 basis points, which is both statistically and economically significant. This decrease in bond yields translates into annual interest savings of US$65,450 for the average bond issue in our sample. Reputable underwriters also help issuers lower the yields by 19 basis points, a significantly weaker effect than that of reputable auditors. The greater impact of hiring reputable auditors is consistent with auditors' multiple roles as information intermediaries, monitors, and insurance providers.

We further examine whether reputable auditors and underwriters provide value with respect to nonpricing terms of bond contracts, such as bond maturity and size.[4] Debt maturity plays an important role in reducing agency costs associated with asset substitution and improving the efficiency of monitoring by lenders (Leland & Toft, 1996; Stulz, 2000). Short bond maturities may reduce agency costs by subjecting managers to more frequent monitoring by investors and rating agencies (e.g., Datta, Iskandar-Datta, & Raman, 2005).

However, hiring a reputable auditor may provide an alternative monitoring mechanism to reduce these costs because reputable auditors are incentivized to monitor issuing firms' financial reporting continuously to maintain their reputation in the industry. As a result, issuing firms with reputable auditors may potentially borrow from bondholders for a longer period compared with those with ordinary auditors. Consistent with our conjecture, we find evidence that hiring reputable auditors, on average, lengthens bond maturities by 2.54 years, a statistically significant effect. We do not find a strong substitution effect between the presence of reputable underwriters and bond maturity. This could be explained by the nature of the underwriters' job. Underwriters are responsible for marketing and selling bonds; however, once the bonds are issued, they do not have any monitoring role.

Finally, we examine the impact of reputable auditors and underwriters on bond size, which is an indicator of the issuing firm's repayment ability. If an issuing firm has a higher level of tangible assets and/or is able to generate larger future cash flows, it can borrow more debt. To the extent that reputable auditors and underwriters can certify the accuracy of tangible assets and the ability to generate cash flows to pay the debt back, issuing firms with reputable auditors and underwriters may be able to borrow a larger amount than those with ordinary auditors and underwriters. In addition to the certification effect, the size of a bond issue also depends on underwriters' marketing and selling abilities. Reputable underwriters have extensive distributional networks and superior selling power, which allow them to place larger bond issues. Consistent with these arguments, we find evidence that reputable underwriters have a strong positive effect on the size of the bond. Specifically, hiring reputable underwriters increases the actual offering amount by 13.73% relative to the average offering amount in our sample. We do not find a similar result for reputable auditors, suggesting that these information intermediaries play a different role in the bond-issuing process.

Our article makes two significant contributions to existing knowledge on the value of auditors and underwriters in the bond market. First, we bridge two disconnected strands of literature by testing the certification hypothesis simultaneously for reputable auditors and underwriters in the bond market. Although Mansi et al. (2004) and Ahmed, Rasmussen, and Tse (2008) have explored the role of auditors in reducing bondholder–shareholder conflicts, reputable underwriters were not considered as additional intermediaries in the analysis. By combining the certification role of reputable auditors with that of reputable underwriters, we highlight different roles played by these important capital market intermediaries with respect to the structuring of public debt financing.

Second, our article contributes to the growing body of literature that examines more detailed aspects of debt contracts (e.g., Brockman, Martin, & Unlu, 2010; Qian & Strahan, 2007). Previous studies in the bond or syndicated loan market attempt to understand the drivers of a single, contractual dimension (typically the bond yield or the loan spread).[5] We provide unique evidence on the effects of reputable auditors and underwriters on the bond maturity and size. As a result, this study sheds light on the role of information intermediaries with reputation capital on the nonpricing terms of bond contracts and examines the joint role of auditors and underwriters in a richer setting than other articles that focused on the equity market.

The remainder of the article proceeds as follows: Section titled ''Related Literature and Hypotheses'' provides a discussion of related literature and formalizes our hypotheses, section titled ''Data and Research Design'' describes empirical strategies and data and is followed by the ''Results'' section that presents the main results, section titled ''Sensitivity Analyses and Additional Tests'' offers some robustness checks, and the final section titled ''Conclusion'' concludes the article.

Related Literature and Hypotheses

The certification hypothesis is derived from the literature on the use of reputation capital to guarantee product quality (Klein & Leffler, 1981). As an extension to this theoretical literature, DeAngelo (1981) shows that when incumbent auditors earn client-specific quasi rents, auditors with a greater number of clients have more to lose by failing to report a discovered breach in a client's accounting system. The higher the value placed by large auditors on their reputation, the better is the quality of their audits. Consistent with this argument, the model of Titman and Trueman (1986) finds that firms that hire high-quality auditors receive greater valuations when securities are issued. Similarly, Booth and Smith (1986) model underwriter reputation as a bonding mechanism to solve the information problems between issuing firms and investors, and find that underwriter reputation is formed either through a premium price charged for quality assurance or the objective of maintaining long-term profits through repeated entries into the market. The models of Chemmanur and Fulghieri (1994) or Beatty and Ritter (1986) provide similar arguments by showing that investment banks' reputations are achieved by adopting stringent evaluation standards. Taken together, these theories imply that reputation capital can provide capital market intermediaries such as auditors and underwriters with incentives to commit to honest information production on the firms they serve.

By providing more accurate information, these information intermediaries allow outside investors to make more precise estimates of firm values and better investment decisions. As intermediaries with reputation capital at stake can be adversely and materially affected if their information certification proves false, investors may accept less protection on the securities issued by firms hiring these intermediaries. Therefore, we hypothesize that both auditors and underwriters with reputation concerns play certification roles that help reduce issuers' cost of debt or relax the nonpricing terms of their debt contracts.

Empirical studies have examined the certification roles of auditors and underwriters separately. Pittman and Fortin (2004) and Mansi et al. (2004) find that the cost of debt is lower for firms with larger auditors. Ahmed et al. (2008) show that industry audit specialists help firms reduce the cost of capital, both equity and debt. Empirical evidence in finance, however, finds that reputable underwriters obtain lower yields and charge higher fees (e.g., Fang, 2005). However, auditors and underwriters have integral, but different, roles in the bond-issuing process, and ignoring either in empirical analyses can lead to imprecise inferences of their respective contributions.

The theoretical model developed by Balvers, McDonald, and Miller (1988) provides guidance for our empirical analysis of auditors and underwriters in the bond market. The model shows that investment banks with reputation concerns are more likely to select high-reputation auditors as a signal of their own quality, and together, they reduce the underpricing of initial public offerings of equity issues. The model also predicts that highly reputable auditors and underwriters have divergent effects on underpricing—as the reputation effect of one intermediary increases, the effect of the other diminishes. We expect these findings to apply to the bond market, as well, for several reasons. First, auditors provide assurance that firms' financial statements are prepared in accordance with Generally Accepted Accounting Principles, whereas underwriters assist firms in documenting, marketing, and selling securities. Hence, the information content of both certification roles can differ, with auditors verifying accounting information before and after a bond is issued, and underwriters affirming to general future prospects about bond issuers.

Second, auditors are at high risk for litigation and play an additional insurance role by indemnifying investors against disclosures of false accounting information. In recent years, the litigation against auditors has grown dramatically, both in frequency and cost.[6] The passage of the Sarbanes-Oxley Act further expanded the legal responsibility of auditors, requiring them to report on the adequacy of client firms' internal control over financial reporting. In addition, auditors—especially those with reputation capital at stake—incur indirect costs from litigation, such as loss of reputation capital. If investors recognize the relatively high litigation costs associated with reputable auditors in the event of failure to detect accounting irregularities, they may place more value on the certification role of reputable auditors than on that of reputable underwriters. Therefore, given the differences in the certified information content and exposed litigation costs that exist between auditors and underwriters, we expect reputable auditors to play a stronger role in reducing the cost of debt than reputable underwriters.

Although the theoretical predictions about the certification effect on the credit spreads are clear, inferences about certification's role on the negotiated nonpricing bond terms are less straightforward. Debt maturity is one of the main nonpricing terms of a bond contract and is well regarded as an ex-post monitoring device. For example, Leland and Toft (1996) argue that short-term debt reduces or even eliminates the agency costs associated with asset substitution. Also, Stulz (2000) illustrates that short-term debt provides creditors with an extremely powerful tool to monitor the borrowing firm's management. Managers with higher stock ownership choose a larger proportion of short-maturity debt, thereby committing to more frequent monitoring (Datta et al., 2005). Auditors, too, play a role in monitoring issuing firms' financial reporting systems. In particular, auditors with a reputation concern have stronger incentives to assure the quality of financial reporting throughout the period when debt is outstanding. Given reputable auditors' incentives to facilitate ex-post monitoring of issuers, one could expect either a substitution or a complementary effect between the presence of reputable auditors and the negotiation of a shorter debt maturity. In contrast, the underwriters' main role is to assist borrowers only at issuance; they have no responsibility to monitor borrowers after issuance. As a result, we do not expect an association between the presence of reputable underwriters and bond maturity.

Another important nonpricing term of a bond contract is the size of the bond issue. The size is associated with default risk—the larger the bond, the greater the pressure on its issuer's repayment ability. To the extent that reputable auditors and underwriters reduce the inherent uncertainty associated with the measurement of default risk at issuance, one would expect an increase in the bond sizes of issuers with these types of intermediaries. The size of a bond issue is also a function of the distributional networks and selling abilities of the underwriter. Reputable underwriters have extensive distributional channels, strong relationships with institutional and individual investors as well as superior marketing and selling abilities, all of which facilitate the issuance of larger amounts of debt (Fang, 2005). Taking this into account, we expect that reputable underwriters potentially play a more important role in increasing the size of the bonds issued when compared with reputable auditors.

Data and Research Design

Proxies of Reputable Auditors and Underwriters

To capture the reputation concerns of auditors and underwriters, we measure their reputation capital based on the magnitude of their respective market share. This is consistent with

the theoretical argument that if an information intermediary, such as an auditor or underwriter, engages in quality cutting, this information disseminates faster if the intermediary has a large market share (e.g., Klein & Leffler, 1981). Furthermore, with a large market share, the expected long-term fee premium from information intermediaries' reputation is also likely to exceed the short-term benefits that could be obtained by misinforming investors. Therefore, the market share reflects the income stream at stake, and larger auditors or underwriters have more to lose from a damaged reputation.

We measure a reputable auditor's market share using the total sales audited by an auditor within an industry (Dunn & Mayhew, 2004; Palmrose, 1986). We focus on the certification role of auditors specializing in a particular industry because they are associated with high-quality audits (Craswell, Francis, & Taylor, 1995; Krishnan, 2003). Becoming an industry specialist requires a significant investment in training and time to establish a solid reputation. Also, industry audit specialists have a large market share, as their expertise is recognized and they are sought out within the industry. As a result, consistent with DeAngelo's (1981) argument, they have more to lose if they fail to detect frauds in their clients' audits.

We define an industry as all firms with the same two-digit primary Standard Industry Classification (SIC) code in the Compustat universe.[7] We designate an auditor as a reputable auditor if its market share is the largest in the industry and outpaces the rest of auditors by at least 10%. The 10% cutoff supports our inferences on the qualitative differences in auditors' reputations in a particular industry. In checking for robustness, we also confirm that using a 15% or 5% cutoff does not alter the robustness of our results. Furthermore, we validate this measure by investigating the association between the presence of industry audit specialists and the accounting and governance risks of the firms that hire them.[8]

Although auditors provide services for the universe of public firms and are pressed to differentiate themselves through industry specialization, underwriters in the debt market, which is not as competitive as the equity market, tend to focus on multiple segments. For instance, Yasuda (2005) documents that underwriters' bank relationships with borrowers have a positive and significant impact on their bond underwriting business.[9] Therefore, we use the market share based on the underwriter's volume in the whole bond market to identify reputable underwriters. We define an underwriter as reputable if its market share persistently ranks among the top five underwriters in the past 3 years.[10] The intuition behind this measure is that an underwriter with a large market share will not imperil its reputation for the sake of short-term profits. Underwriters with a large market share extract economic rents on reputation from their clients (Fang, 2005). Moreover, they are repeat players, and the poor performance of a bond not only damages their reputation in the bond market but could also affect their businesses in other areas, such as bank lending, equity underwritings, or Mergers & Acquisitions Advisory services. In robustness checks (see section titled ''Sensitivity Analyses and Additional Tests''), we also present results using the top eight underwriters and classifying reputable underwriters based on the number of bonds they place.

Regression Specifications

This section presents the regression specifications concerning the effects of reputable auditors and underwriters on the bond terms. To examine the certification roles of reputable auditors and underwriters on bonds' spreads, we estimate the following regression (we present the computation of all variables in Appendix A):

$$\begin{aligned} Credit\ Spread = {} & \alpha + \beta\ Reputable\ Auditor + r\ Reputable\ Underwriter \\ & + \theta\ Interaction\ Term + \pi\ Firm\ Controls + \upsilon\ Bond\ Controls \\ & + \sigma\ Industry - and\ Year - Fixed\ Effects + \varepsilon. \end{aligned} \quad (1)$$

The dependent variable *Credit Spread* represents the risk premium that investors require to hold the issuer's bond, taking into consideration the effect of business cycles. *Credit Spread* is a better proxy for the cost of debt than interest expense used by prior studies for several reasons. First, the interest expense field pools together the cost of debt with different types of lenders, different maturities, and security features. Banks rely less on auditors than bondholders because they have access to private information that is not reflected in public financial statements. Even within public debt, debt securities are not homogeneous, and they cannot be pooled easily unless their distinctive features are controlled for in the empirical tests. Second, the interest expense field from Compustat includes other items that are irrelevant to the cost of debt, such as amortization of expenses associated with debt issuance.[11] Third, the interest expense is not adjusted for treasuries; thus, the measure moves with the interest rate environment or macroeconomic conditions, which may create spurious correlations.

Reputable Auditor and *Reputable Underwriter* are indicator variables equal to ''1,'' if an issue is certified by reputable auditors or reputable underwriters, and ''0'' otherwise. We also include an interaction term, *Reputable Auditor* and *Reputable Underwriter* to examine whether the effects of reputable auditors and underwriters on credit spreads vary with each other.

We control for firm-specific variables to account for cross-sectional differences in credit spreads beyond the effect of hiring reputable auditors and underwriters. We include auditor tenure (*Tenure*) as it has been shown to be negatively related to credit spreads because of its role in reducing the information asymmetry between the issuer and the investors (Mansi et al., 2004). Firm size and leverage are proxies for the issuer's financing risk. We measure them as the natural log of total assets of the issuer (*Firm Size*) and the ratio of long-term debt to total assets (*Leverage*), respectively. To control for the issuer's risk of repaying the debt and the coupons, we also include the asset tangibility computed as net property plant and equipment scaled by total assets (*Tangibility*) and the return on assets (*ROA*) in the regression.

Furthermore, we control for bond variables in our analysis. Although put options or sinking fund features add safety to bond issues and are expected to be negatively related to credit spreads, call options or subordinated clauses put bondholders at a disadvantage and, therefore, are priced in the risk premium. We include maturity and bond size in the regression of credit spreads, as the potential losses to bond investors increase in the time horizons of repayments and the offering amounts. Furthermore, restrictive covenants mitigate the wealth transfer from bondholders to shareholders. Investors demand more covenants if the risk of wealth expropriation or asset substitution is more severe. Hence, we use the number of covenants to account for the riskiness of bond issues due to a higher agency cost of debt.

Credit-rating agencies, as information intermediaries, also provide independent assessments of the issuer's credit risk. As they have access to the issuer's private information, their opinions are valued by bondholders. Therefore, we include credit-rating information as a control in our analysis of credit spread. We designate an indicator variable *Speculative Grade* equal to ''1'' to the issues rated below a BBB rating by Moody's or Standard & Poor's (S&P's), and ''0'' otherwise.

We then examine the relationship between reputable auditors and underwriters and bond maturities, controlling for the risk of bonds as well as other factors known to influence bond maturities. The specification of the maturity regression is as follows:

$$\begin{aligned} Maturity = {} & \alpha + \beta\, Reputable\,Auditor + r\, Reputable\,Underwriter \\ & + \theta\, Interaction\,Term + \pi\, Firm\,Controls + \upsilon\, Bond\,Controls \\ & + \sigma\, Industry - and\,Year - Fixed\,Effects + \varepsilon. \end{aligned} \tag{2}$$

Maturity is measured as the maturity date of a bond issue minus its offering date in years. In this test, we also include *Credit Spread* as an additional control variable because it reflects the inherent risk associated with bond issues. Furthermore, because credit spreads already incorporate the credit risk assessments provided by credit-rating agencies, we do not include the credit-rating information in this regression. The remaining control variables are similar to the ones we use in the *Credit Spread* regression.

Finally, to explore the effects of reputable auditors and underwriters on bond sizes, we use a similar regression specification as the regression of bond maturity:

$$\begin{aligned} Bond\,Size = {} & \alpha + \beta\, Reputable\,Auditor + r\, Reputable\,Underwriter \\ & + \theta\, Interaction\,Term + \pi\, Firm\,Controls + \upsilon\, Bond\,Controls \\ & + \sigma\, Industry - and\,Year - Fixed\,Effects + \varepsilon. \end{aligned} \tag{3}$$

To account for the possibility that there are shifts in debt financing over time caused by changes in general capital market conditions, we include year-fixed effects in all bond terms regressions. Furthermore, we also add fixed effects at the industry level, given that the cost of debt and other bond terms vary with the industry membership (e.g., Jorion, Shi, & Zhang, 2009). We account for the correlation of error terms across observations that belong to the same issuing firm by calculating robust standard errors that allow for clustering at the firm level.

Data and Descriptive Statistics

We use two data sources for our main analysis: the Compustat database and the Mergent Fixed Income Securities Database (FISD). The former provides us information to measure the reputation of auditors and other firm-level variables, whereas the latter enables us to identify our dependent variables, the reputation of underwriters, and other bond-specific characteristics that we use as controls in our empirical tests. Information on corporate bond issues received reasonable coverage in 1995; therefore, we focus our analysis from 1995 to 2006.

To calculate the market shares of auditors in each industry, we begin with a sample of firm-year observations that have sales information in the Compustat database. Based on these market shares, we construct the reputable auditor measure for each of the years in our sample.[12] We then manually match this Compustat sample with the Mergent FISD bond data (based on company names, industry, and location), excluding observations without information on firm-level control variables (size, leverage, etc.). We do not consider corporate bonds that are convertible, privately placed, issued in foreign currencies, or do not have fixed coupon payments. These filters allow us to select a more homogeneous group of bond securities that facilitates better cross-sectional comparisons. As the majority of

Table 1. Sample Selection and Distribution

Panel A: Sample selection

Description	Observations
Reputable auditor sample	60,337
Eliminate observations without information on firm-level control variables	(790)
Eliminate observations without bond information	(49,143)
Eliminate firms audited by non Big Auditors	(128)
Eliminate observations without underwriter information	(759)
Final sample	9,517

Panel B: Sample distribution by year

Year	Firm-level observations	Bond issue-level observations
1995	54	239
1996	82	361
1997	106	482
1998	202	554
1999	126	617
2000	64	439
2001	181	759
2002	62	153
2003	330	2,239
2004	196	1,551
2005	199	1,330
2006	169	793
Total	1,771	9,517

Note: Panel A of Table 1 presents the observation selection process. We first construct a sample based on the identification of reputable auditors. We then delete observations without information on firm-level control variables. We merge the resulting sample with the Mergent Fixed Income Securities Database to get bond issue-level variables. As we only focus on firms audited by Big Auditors, we eliminate firms audited by non Big Auditors. Finally, we delete observations that do not have underwriter information. Panel B looks at the distribution of the firm-level and bond issue-level observations by year. Our sample is over the period from 1995 to 2006.

auditors hired by firms issuing bonds are Big Auditors (98% in our matched sample), we further eliminate firms not audited by Big Auditors and focus on the variation of reputation concerns that pertains to industry expertise.

Finally, we exclude issues without underwriting information. As a result, our final sample consists of 9,517 bond issue-level observations. We include financial institutions in our analysis because prior literature (e.g., Craswell et al., 1995) argues that the demand for auditor industry specialization is increasing in the complexity of auditing tasks. Financial institutions have complicated contracts for financial instruments and derivatives, requiring auditors with sophisticated financial knowledge to prepare the audits.

We present the details of our sample selection process in Panel A of Table 1. As firms often issue multiple bonds over the sample period or during a year, we report both firm-level and issue-level distributions by year in Panel B of Table 1. Our final sample comprises 1,771 firm-year observations and 9,517 bond issue-year observations. Panel A of Table 2 presents summary statistics for all variables used in our tests grouped depending

on whether they capture firm or bond characteristics. On average, 27% of bond issues in our sample are certified by reputable auditors. The standard deviation of the reputable auditor measure *Reputable Auditor* is 0.45. The average auditor–client relationship is about 6 years (*Tenure*). Also, the average leverage ratio is 43%, suggesting that the firms in our sample rely more on debt financing than the average Compustat firm (25%). Firms in our sample are relatively large, consistent with the fact that large firms frequently access the corporate bond market.

The average value of the indicator variable *Reputable Underwriter* is 0.09, implying that 9% of bond issues are placed by reputable underwriters. *Credit Spread*, measured as the difference between a bond issue's offering yield and the yield of a matching treasury issue, is the pricing term of a bond and captures the direct cost of borrowing. The match with treasury bills' yields integrates the influence of business cycles on the corporate bond market. The average credit spread of bonds in our sample is about 130 basis points, with a standard deviation of about 146 basis points. The mean maturity of bonds is approximately 9.01 years, consistent with the fact that bonds are usually issued with long terms. *Bond Size* is calculated as the logarithm of an issue's offering amount, and its mean value is 9.83, with a standard deviation of 2.14. We assign numeric values to the credit ratings of Moody's or S&P's.[13] The variable *Credit Rating* is an increasing function of the riskiness of a bond issue. The average firm in our sample receives a rating level of 6.75, well within the investment grade range. We also report the Spearman correlations among all the variables in Panel B of Table 2.

Results

Univariate Evidence

We begin with univariate tests to show preliminary evidence for the effects of reputable auditors and underwriters on bonds' pricing and nonpricing terms. In Panel A of Table 3, we present the results of *t* tests of mean differences in the credit spreads, maturities, and bond sizes between issues with reputable auditors and those without. As shown in Panel A, the mean credit spread for the bonds issued with reputable auditors is significantly lower than that for the bonds without reputable auditors at the 1% level, suggesting that reputable auditors play a role in reducing the cost of borrowing. Furthermore, we find that maturities are significantly longer for issues with reputable auditors at the 1% level too, consistent with the argument that reputable auditors substitute for the role of short-term debt as a monitoring device. The size of a bond is statistically larger for issues certified by reputable auditors, seemingly supporting the hypothesis that reputable auditors reduce the information risk in bond issues and, in turn, bondholders are willing to provide more debt capital.

Panel B of Table 3 presents univariate results for firms hiring reputable underwriters. Although the role of reputable underwriters on nonpricing terms is consistent with its certification role in reducing the agency's cost of debt, its effect on the credit spreads seems to be at odds. Issues with reputable underwriters are associated with larger credit spreads. As this univariate test does not control for other correlated variables that explain credit spreads, we rely on multivariate regression specifications to make proper inferences about the role of reputable underwriters on the spreads. However, the effect of hiring reputable underwriters on bond maturity and size is consistent with the arguments that they are reducing information asymmetries and have access to extensive distribution channels. Firms that

Table 2. Summary Statistics

Panel A: Descriptive statistics

	Number of observation	*M*	*SD*	Distribution		
				25th	50th	75th
Firm characteristics						
Reputable Auditor	9,517	0.27	0.45	0.00	0.00	1.00
Tenure	9,517	6.12	3.28	3.00	6.00	9.00
Leverage	9,517	0.43	0.17	0.32	0.45	0.53
Tangibility	9,517	22.75%	23.76%	8.18%	13.17%	31.06%
ROA	9,517	9.05%	4.85%	6.53%	8.18%	9.90%
Firm Size	9,517	10.48	1.79	9.37	10.27	12.03
Bond characteristics						
Reputable Underwriter	9,517	0.09	0.28	0.00	0.00	0.00
Credit Spread	9,517	1.30	1.46	0.47	0.86	1.71
Credit Rating	9,517	6.71	4.76	5.00	6.00	7.00
Maturity (years)	9,517	9.01	8.04	4.00	7.00	10.00
Offering Amount ($)	9,517	187,421	2,061,696	3,467	13,229	150,000
Bond Size	9,517	9.83	2.14	8.15	9.49	11.92
Callable	9,517	0.45	0.50	0.00	0.00	1.00
Putable	9,517	0.01	0.08	0.00	0.00	0.00
Sinking Fund	9,517	0.00	0.06	0.00	0.00	0.00
Subordinated	9,517	0.01	0.10	0.00	0.00	0.00
No. of Covenants	9,517	1.64	3.54	0.00	0.00	0.00

Panel B: Correlations

	Credit Spread	*Maturity*	*Bond Size*	*Credit Rating*	*Reputable Auditor*	*Reputable Underwriter*	*Tenure*	*Leverage*	*Tangibility*	*ROA*	*Firm Size*	*Callable*	*Putable*	*Sinking Fund*	*Subordinated*
Maturity	.20***														
Bond Size	.38***	.17***													
Credit Rating	.58***	−.06***	.32***												
Reputable Auditor	−.06***	.25***	.15***	−.23***											

(continued)

Table 2. (continued)

Panel B: Correlations

	Credit Spread	*Maturity*	*Bond Size*	*Credit Rating*	*Reputable Auditor*	*Reputable Underwriter*	*Tenure*	*Leverage*	*Tangibility*	*ROA*	*Firm Size*	*Callable*	*Putable*	*Sinking Fund*	*Subordinated*
Reputable Underwriter	.10***	.11***	.32***	.11***	.11***										
Tenure	.06***	.01	−.07***	−.11***	.03***	−.01									
Leverage	.13***	−.16***	−.30***	.09***	−.33***	−.13***	.01								
Tangibility	.22***	.16***	.34***	.22***	.03***	.14***	−.04***	−.32***							
ROA	.10***	.07***	.33***	.20***	−.06***	.13***	−.18***	−.33***	.62***						
Firm Size	−.15***	−.12***	−.29***	−.42***	.07***	−.18***	.42***	.17***	−.36***	−.42***					
Callable	.37***	.62***	.27***	.16***	.14***	.15***	.15***	−.06***	.19***	.10***	−.15***				
Putable	−.05***	.09***	.02***	.00	−.01	.01	−.07***	−.02**	.05***	.07***	−.05***	−.04***			
Sinking Fund	−.01	.05***	.05***	−.01	.03***	−.01	−.02**	−.02**	.07***	−.00	−.04***	.06***	−.00		
Subordinated	−.06***	.03***	−.01	−.07***	.07***	−.01*	−.09***	−.11***	.14***	.02**	−.04***	−.01*	−.01	.39***	
No. of Covenants	.38***	.24***	.66***	.46***	.15***	.31***	−.14***	−.23***	.37***	.37***	−.53***	.37***	.01	.02**	−.02**

Note: ROA = return on assets. This panel reports the pair-wise Spearman correlations of variables used in the analyses.
*,**, *** are 10%, 5%, and 1% significance levels, respectively.

Table 3. Univariate Tests

Panel A: Reputable versus ordinary auditor				
	M_1	M_0	Difference in *M*	*t* statistic
Credit Spread	1.18	1.34	−0.16***	−4.72
Maturity	11.94	7.91	4.03***	22.32
Bond Size	10.38	9.62	0.76***	15.70
Panel B: Reputable versus ordinary underwriters				
	M_1	M_0	Difference in *M*	*t* statistic
Credit Spread	1.77	1.25	0.52***	10.02
Maturity	12.06	8.71	3.35***	11.60
Bond Size	12.16	9.60	2.56***	35.33

Note: This table presents the results for univariate tests of reputable auditors and reputable underwriters. In Panel A, we compare the differences in bond terms between firms hiring reputable auditors and those hiring ordinary auditors. In Panel B, we compare the differences in bond terms between firms hiring reputable underwriters and those hiring ordinary underwriters. M_1 is the average *Credit Spread*/*Maturity*/*Bond Size* for firms hiring reputable auditors or underwriters, whereas M_0 is the average *Credit Spread*/*Maturity*/*Bond Size* for firms hiring ordinary auditors or underwriters. Difference in *M* calculates the differences in bond terms between firms hiring reputable auditors/underwriters and those hiring ordinary auditors/underwriters. *t* statistics are from one-tailed *t* tests.
*,**, *** are 10%, 5%, and 1% significance levels, respectively.

hire reputable underwriters obtain bonds with a significantly longer term at the 1% level and can issue larger bonds also at the 1% level.

Multivariate Evidence

Table 4 reports the results regarding the effects of reputable auditors and underwriters on credit spreads, maturities, and bond sizes. In Models 1, 3, and 5, we estimate the effects of reputable auditors and underwriters on bond terms in a reduced form that only includes firm, industry, and year-fixed effects (e.g., Qian & Strahan, 2007). This mitigates the concern that bond features such as offering yield or maturity likely are simultaneously determined and therefore might produce biased estimates when included as explanatory variables. Models 2, 4, and 6 correspond to the full regression specifications.

Models 1 and 2 show the results of the credit spread regression. In Model 1, without controlling for bond characteristics, the effect of reputable auditors is negative and statistically significant at the 10% level. Model 2 displays the results for the full regression of credit spread as specified in the previous section. Consistent with the certification hypothesis, the coefficient estimates on both reputable auditors and reputable underwriters are negative and statistically significant at the 1% and 10% level, respectively. These results can be interpreted as evidence that intermediaries with reputation concerns help issuers obtain lower costs of debt. Furthermore, in terms of economic magnitude, reputable auditors on average reduce credit spreads by 35 basis points, whereas reputable underwriters receive only a 19 basis points decrease in spreads. This effect suggests that for the average bond issued by a firm hiring reputable auditors and underwriters, the cost of debt is lower by US$65,597 and US$35,609, respectively.

Table 4. Bond Terms Analysis

	Credit Spread				*Maturity*				*Bond Size*			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Explanatory variables	Coefficient	*t* statistic	Coefficient	*t* statistic	Coefficient	*t* statistic	Coefficient.	*t* statistic	Coefficient	*t* statistic	Coefficient	*t* statistic
Reputable Auditor	−0.31*	−1.78	−0.35***	−2.68	3.18***	3.09	2.54***	2.75	−0.01	−0.03	−0.11	−0.66
Reputable Underwriter	0.16	1.05	−0.19*	−1.73	0.75	0.78	0.92	1.14	1.74***	5.26	1.35***	4.82
Interaction	0.02	0.13	0.15	1.13	−0.48	−0.33	−0.84	−0.65	−0.03	−0.08	0.11	0.26
Firm characteristics												
Tenure	0.05	1.40	0.02	0.96	0.03	0.15	−0.10	−0.63	0.03	0.52	0.01	0.18
Leverage	2.00***	3.62	0.96***	2.75	3.41	0.79	1.89	0.60	−0.86	−1.32	−1.82***	−3.35
Firm size	−0.12	−1.29	0.01	0.20	0.52	1.52	0.42	1.47	0.09	0.82	0.25***	2.57
Tangibility	−0.01	−0.76	0.01**	2.50	0.01	0.25	0.01	0.43	−0.01	−0.64	0.01	0.55
ROA	−0.02	−1.57	−0.01	−0.05	0.07*	1.69	0.023	0.50	0.03*	1.84	0.04***	3.26
Bond characteristics												
Putable			−0.58***	−2.70			15.70***	4.77			−0.02	−0.05
Callable			0.24***	2.87			7.86***	7.65			0.21**	2.33
Sinking fund			−0.80***	−3.64			2.71	1.56			1.68***	4.01
Subordinated			0.28*	1.69			−1.82	−0.63			−0.74	−1.31
Maturity			0.01	1.63							0.01	0.54
Bond Size			0.04*	1.79			0.08	0.56				
No. of Covenants			0.14***	11.66			−0.35***	−4.78			0.26***	7.02
Speculative Grade			1.34***	12.40								
Credit Spread							−0.07	−0.35			0.01	0.22
Industry- and Year-Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
N	9,517		9,517		9,517		9,517		9,517		9,517	
Adjusted R^2	.10		.47		.03		.29		.17		.48	
F statistic			2.96*				3.29*				28.08***	

Note: ROA = return on assets. This table presents the main results for bond terms regressions. Models 1 and 2 report the results when *Credit Spread* is the dependent variable. Models 3 and 4 present the results for the maturity regressions. Models 5 and 6 report the results when *Bond Size* is the dependent variable. *Interaction* is an interaction term of *Reputable Auditor* and *Reputable Underwriter*. *SE*s are clustered at the firm level. See Appendix A for variable definition.

*, **, *** are 10%, 5%, and 1% significance levels, respectively.

The null that the coefficient of *Reputable Auditor* equals to that of *Reputable Underwriter* is rejected at the 10% level. The economic significance of the coefficient estimate on reputable auditors is also stronger than that on reputable underwriters. Thus, these results imply that reputable auditors play a relatively more important role in certifying the quality of bond issues, consistent with the additional insurance role of reputable auditors who provide effective legal protection for bondholders against potential losses arising from fraud audits. The coefficient estimate of the interaction term of reputable auditor and underwriter is not significant, implying that the effect of hiring a reputable auditor on credit spreads does not vary with that of hiring reputable underwriters.

The signs of the coefficient estimates for the control variables are as expected: Higher leverage is associated with higher credit spreads, reflecting greater credit risk. Issues with put options or sinking fund features receive lower credit spreads, whereas callable or subordinated bonds receive higher credit spreads. *Speculative Grade* is strongly positive and significant, indicating that bondholders incorporate the risk assessments of credit-rating agencies into their decision of risk premiums on bonds.

Models 3 and 4 show the results of the effects of reputable auditors and underwriters on the maturities of bonds. In both models, the coefficient estimates on reputable auditors are positive and significant, whereas those on reputable underwriters are positive but not significant. Specifically, in Model 4, the coefficient on *Reputable Auditor* indicates that hiring reputable auditors on average lengthens bond maturities by 2.54 years. These results imply that the monitoring role of reputable auditors substitutes for the ex-post monitoring role of the short-term debt. Thus, issuers can issue bonds with longer maturities when they hire reputable auditors.

Turning to bond size, in Models 5 and 6, we find that, in contrast to the maturity regression, the coefficient estimate on reputable underwriters is significantly positive, whereas the estimate on reputable auditors is negative but not significant. The F test rejects the null that the coefficient estimate on reputable underwriters equals to that on reputable auditors at the 1% significance level. These results indicate that the role of reputable underwriters is more valued in determining the issuing amounts of bonds, consistent with the extensive distribution networks and superior marketing and selling skills that reputable underwriters have. The point estimate of 1.35 for the coefficient on the variable *Reputable Underwriter* implies that hiring reputable underwriters on average increases the actual offering amount by about 13.73%.

Taken together, the multivariate results from Table 4 demonstrate that reputable auditors and underwriters have a significant impact on bonds' pricing as well as nonpricing terms. In the presence of reputable auditors, credit spreads are much lower, and bond maturities are significantly longer; whereas with reputable underwriters, credit spreads are marginally lower, and bond sizes are significantly larger. These results are consistent with the certification hypothesis and the multiple roles that reputable auditors and underwriters play in the bond market.

Sensitivity Analyses and Additional Tests

Self-Selection Bias

The previous literature suggests that the choices of auditors and underwriters may be subjected to a selection bias (e.g., Chaney, Jeter, & Shivakumar, 2004; Fang, 2005). To the extent that unobservable determinants of the auditors' and underwriters' choices correlate

with bond terms, our coefficient estimates are biased and our inferences are confounded. Hence, in this section, we address the selection-bias issue of reputable auditors and underwriters and demonstrate that the inferences drawn from ordinary least squares [OLS] regressions remain robust.

Endogenous Switching Model

We first use an endogenous switching model to address the selection-bias issue of reputable auditors and underwriters (Maddala, 1983). Conceptually, we want to hold the bond issue constant and keep separate the treatment effects on bond terms due to reputable auditors and underwriters. More specifically, we are interested in the following counterfactual outcomes: For an issue certified by a reputable auditor or underwriter, what would the alternative credit spread, maturity, and bond size be had it been certified by an ordinary auditor or underwriter? Empirically, the endogenous switching model gives us a way to determine these hypothetical outcomes. The model consists of a regression of the choice of reputable auditors or underwriters and two outcome equations on the dependent variables of interest—one for issues with reputable auditors/underwriters, and one for issues with ordinary auditors/underwriters:

$$\text{Reputable Auditor or Underwriter}_i = Z_i'\gamma + \varepsilon_i \tag{4}$$

$$y_{1_i} = x_i'\beta_1 + u_{1_i} \tag{5}$$

$$y_{2_i} = x_i'\beta_2 + u_{2_i} \tag{6}$$

The vector Z_i contains the factors that affect the issuer's choice of reputable auditors or underwriters. We include firm-level variables such as leverage, size, tangibility, and ROA in this vector. We also add two nonlinear terms in Z_i, the squares of leverage and firm size, because we expect that the choice of a reputable underwriter or auditor to be nonmonotonic. Larger and more indebted firms are more likely to choose reputable information intermediaries because of their increased complexity.[14] The endogeneity is then modeled by allowing the error term in the regression of the auditor/underwriter choice to correlate with the error terms in the outcome equations (i.e., Regressions 5 and 6, where the dependent variables are the bond yields, maturities, or sizes). In this way, the unobserved factors that affect the choice of reputable auditors or underwriters are also allowed to influence bond terms.

In addition to addressing the endogeneity concern, the switching regression also relaxes the restriction that the estimates of the β parameters are identical for issues with reputable auditors/underwriters and those with ordinary auditors/underwriters. By estimating the coefficients of variables in the vector X separately, the model provides the estimates needed to calculate the hypothetical outcomes of bond terms.

Table 5 presents the results of the endogenous switching regressions. Panel A shows that reputable auditors are more likely to certify smaller issuers with lower leverage and larger tangible assets. We also include *Reputable Underwriter* as a control variable because Balvers et al. (1988) suggest that the underwriter influences the auditor choice. Reputable underwriters may more frequently select reputable auditors as a reflection of their high reputation. Consistent with this argument, Panel A of Table 5 shows that the presence of

Table 5. Switching Regressions

Panel A: Choices of reputable auditors and underwriters

	Reputable Auditor		*Reputable Underwriter*	
	Coefficient	z statistic	Coefficient	z statistic
Leverage	−5.65***	−4.11	−1.85***	−3.08
Firm Size	−1.84**	−2.27	0.73**	2.22
Tangibility	0.01***	2.81	0.01**	2.03
ROA	−0.01	−0.80	0.01	1.35
Firm Size^2	0.09**	2.20	−0.04**	−2.39
Leverage^2	2.75***	3.20	1.44**	2.54
Reputable Auditor			0.35***	3.08
Reputable Underwriter	0.36***	2.80		
Year-Fixed Effects	Yes		Yes	
Industry-Fixed Effects	Yes		Yes	
N	9,517		9,517	
Pseudo R^2	.24		.11	

Panel B: Switching regressions for reputable auditors

	Credit Spread				*Maturity*				*Bond Size*			
	Group 1		Group 2		Group 1		Group 2		Group 1		Group 2	
	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic
Reputable Underwriter	0.04	0.58	−0.18*	−1.75	−0.17	−0.24	0.80	1.02	1.49***	4.00	1.31***	5.09
Tenure	−0.01	−0.19	0.06*	1.88	0.09	0.72	−0.25	−1.23	0.01	0.35	0.03	0.49
Leverage	1.20***	4.22	2.03***	3.33	−0.43	−0.16	−0.22	−0.07	−4.25***	−2.72	−1.32	−1.28
Firm size	−0.16***	−5.23	0.02	0.29	0.47	1.36	0.05	0.18	0.19	1.24	0.20**	2.15
Tangibility	−0.01	−0.19	−0.01	−0.97	0.04**	2.24	0.04**	2.39	0.01***	2.80	0.01	0.07
ROA	−0.03***	−5.08	−0.01	−0.60	0.14**	2.20	−0.01	−0.31	0.01	0.27	0.02*	1.77
Putable	−1.58**	−2.25	−0.09	−0.50	18.90***	6.60	15.82***	3.81	−0.22	−0.42	0.51	0.71
Callable	0.03	0.61	0.28**	2.13	9.75***	14.40	7.40***	5.45	1.06***	4.00	0.01	0.09

(continued)

Table 5. (continued)

Panel B: Switching regressions for reputable auditors

	Credit Spread				*Maturity*				*Bond Size*			
	Group 1		Group 2		Group 1		Group 2		Group 1		Group 2	
	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic
Sinking Fund	−0.32	−1.14	−0.83***	−2.74	−0.51	−0.19	2.67	1.12	1.66***	3.65	2.12***	3.90
Subordinated	0.27	1.07	0.05	0.13	−4.45**	−2.09	−1.63	−0.62	−0.62	−0.84	−1.20**	−2.00
Maturity	0.01***	4.43	−0.01	−0.86					0.01	0.87	0.01	0.22
Bond Size	−0.01	−0.57	0.02	1.52	−0.11	−0.60	0.24*	1.73				
No. of Covenants	0.10***	6.40	0.11***	4.79	−0.66***	−4.66	−0.20**	−2.47	0.26***	5.71	0.27***	6.56
Speculative Grade	1.28***	7.55	1.31***	10.84								
Credit Spread					1.01***	3.25	−0.25	−1.14	−0.17	−1.47	0.08	1.17
Group 1: Reputable auditor = 1		Actual				Hypothetical		Difference			*t* statistics	
Credit Spread		1.18				1.92		−0.74***			−34.51	
Maturity		11.94				8.42		3.52***			21.40	
Bond Size		10.38				10.75		0.37***			−10.24	
Group 2: Reputable auditor = 0		Actual				Hypothetical		Difference			*t* statistics	
Credit Spread		1.34				1.11		0.23***			15.85	
Maturity		7.91				9.81		−1.90***			−22.81	
Bond Size		9.61				10.31		−0.70***			−31.51	

Panel C: Switching regressions for reputable underwriters

	Credit Spread				*Maturity*				*Bond Size*			
	Group 3		Group 4		Group 3		Group 4		Group 3		Group 4	
	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic
Reputable Auditor	0.11	0.10	−0.33**	−2.53	0.92	1.05	2.57***	2.81	−0.54	−1.62	0.47*	1.78
Tenure	−0.09	−0.29	0.02	0.86	0.01	0.12	−0.20	−1.09	−0.08*	−1.70	−0.01	−0.01
Leverage	0.24	0.09	0.87***	3.01	−8.37***	−4.37	−0.02	−0.01	−3.57***	−7.69	−2.70***	−3.40
Firm Size	−0.21	−1.60	0.02	0.53	0.55	1.53	0.15	0.58	0.24*	1.85	0.19**	1.97
Tangibility	0.01	0.37	0.01	1.39	0.09***	4.66	0.03**	2.45	0.01***	4.88	0.01	1.26

(continued)

Table 5. (continued)

Panel C: Switching regressions for reputable underwriters

	Credit Spread				*Maturity*				*Bond Size*			
	Group 3		Group 4		Group 3		Group 4		Group 3		Group 4	
	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic
ROA	−0.01	−0.02	−0.01	−0.62	0.11	1.28	0.01	0.41	0.04**	1.96	0.03	1.58
Putable	−0.87	−1.53	−0.48*	−1.81	20.52***	7.62	15.72***	3.73	0.72**	2.40	−0.08	−0.15
Callable	−0.22	−0.25	0.27***	2.88	4.71***	4.04	8.28***	8.05	0.48***	2.96	0.09	0.48
Sinking Fund	1.47	0.84	−0.79***	−4.31	3.66	1.16	1.01	0.66	1.78***	3.42	2.52***	3.71
Subordinated	−0.01	0.00	0.57***	2.72	−3.55	−1.13	−2.37	−1.43	−1.89*	−1.93	−1.28*	−1.69
Maturity	0.02*	1.74	0.01	0.60					−0.01	−1.25	0.02**	2.21
Bond Size	0.51	0.36	0.04*	1.75	−0.24	−0.38	0.17	1.37				
No. of Covenants	0.11	0.88	0.13***	9.85	−0.43***	−3.93	−0.27***	−3.49	0.27***	8.65	0.33***	10.57
Speculative Grade	0.98	0.61	1.25***	9.95								
Credit Spread					0.99***	3.81	−0.19	−0.89	0.21***	2.82	−0.01	−0.06
Group 3: Reputable underwriter = 1		Actual				Hypothetical			Difference			*t* statistics
Credit Spread		1.78				1.88			−0.10**			−2.58
Maturity		12.06				10.28			1.78***			5.18
Bond Size		12.16				10.45			1.71***			30.34
Group 4: Reputable underwriter = 0		Actual				Hypothetical			Difference			*t* statistics
Credit Spread		1.25				1.12			0.13***			7.18
Maturity		8.72				12.51			−3.79***			−43.69
Bond Size		9.60				12.03			−2.43			−0.01

Note: ROA = return on assets. This table presents the main results for bond terms regressions using endogenous switching regressions. Panel A reports probit estimates for the choice of reputable auditors and underwriters, using the squares of firm size and leverage as instrument variables. Panel B presents the results of switching regressions for reputable auditors. It also reports the actual values of bond terms versus their counterfactual hypothetical values for firms hiring reputable auditors (Group 1) and firms not hiring reputable auditors (Group 2). Panel C presents the results of switching regressions for reputable underwriters. It also reports the actual values of bond terms versus their counterfactual hypothetical values for firms hiring reputable underwriters (Group 1) and firms not hiring reputable underwriters (Group 2). Difference is the mean difference between actual and hypothetical values of bond terms. Standard errors are clustered at the firm level. See Appendix A for variable definitions.

*,**, *** are 10%, 5%, and 1% significance levels, respectively.

reputable auditors is positively and significantly associated with the presence of reputable underwriters.

Table 5, Panel B displays the results of the outcome equations. Although most variables have the same sign in both equations corresponding to credit spreads, maturities, and bond sizes, their magnitudes are notably different for bonds issued by firms hiring reputable and ordinary auditors. This supports the relaxation of the assumption that the coefficient estimates of explanatory variables are identical across the two alternative regimes (*Reputable Auditor* = 1 vs. *Reputable Auditor* = 0). Furthermore, in the outcome regressions of credit spreads, reputable underwriters appear to exert a negative effect only in the equation of issues with ordinary auditors (*Reputable Auditor* = 0). This result suggests that, after controlling for the selection of reputable auditors, there is an interaction effect between reputable auditors and reputable underwriters; namely, reputable underwriters play the certification role in the absence of reputable auditors.

The separate estimations of bond terms across issues with reputable auditors and those without show that the effects of the control variables on bond terms vary with the presence/absence of reputable auditors. More importantly, such estimation techniques also enable us to calculate the hypothetical outcomes of bond terms in alternative regimes. We do so by applying the coefficient estimates of the regime of reputable auditors to issues with ordinary auditors, and vice versa. Panel B of Table 5 compares the means of the actual values of bond terms with their hypothetical counterparts, derived from the switching models. For issues certified by reputable auditors (Group 1), the actual credit spread and maturity are 118 bps and 11.94 years, respectively. If certified by ordinary auditors, the hypothetical spread and maturity would be 192 bps and 8.42 years, 74 bps more and 3.52 years shorter than the actual case, these differences being statistically significant.

In contrast, the average issue with ordinary auditors (Group 2) has a credit spread of 134 bps and a maturity of 7.91 years. If certified by reputable auditors, the credit spread would decrease by 23 bps, and the maturity would lengthen by 1.90 years. Again, the differences between these actual and hypothetical values are statistically significant. In the case of issues with ordinary auditors, their average bond size would have been larger, as well.

We apply the endogenous switching model again to account for the self-selection bias of reputable underwriters. We also calculate the differences in bond terms across the regimes of reputable and ordinary underwriters. Panel C of Table 5 presents these results. For issues certified by reputable underwriters, the actual credit spread and maturity are 178 bps and 12.06 years, respectively. If certified by ordinary underwriters, the hypothetical spread would increase by 10 bps and the bond maturity would decrease by 1.78 years. For issues placed by ordinary underwriters, the actual credit spread and bond maturity are 125 bps and 8.72 years, respectively. Consistent with the main results, we also find that the bond size decreases by approximately 17.39% relative to the average offering amount in our sample (computed as 1.71 divided by 9.83). If placed by reputable underwriters, their spread would be 13 bps less, their maturities would be 3.79 years longer, and their size would increase by 24.72% relative to the average offering amount. This evidence shows that, after controlling for the self-selection bias of reputable underwriters, the presence of reputable underwriters can help issuers obtain favorable credit spreads, bond maturities, and offering amounts. In particular, the substitution effect between hiring reputable underwriters and the monitoring role of short-term debt turns out to be significant.

Overall, these sensitivity tests document that the positive impacts of reputable auditors and underwriters on bond terms shown in our main OLS regressions are robust after controlling for selection-bias problems.

Changes Analysis

We use a change specification of our regressions to further address the selection-bias issues regarding both reputable auditors and underwriters. This change approach can eliminate firm-level unobserved factors that could potentially confound our results and that allows us to establish a stronger causal link between the types of the two intermediaries and the bond terms of interest.

Panel A of Table 6 presents descriptive statistics of the changes in bond terms caused by changes of reputable auditors and underwriters, respectively. Columns (1) and (2) report the statistics concerning the changes in credit spreads, maturities, and bond sizes after issuing firms switch from ordinary auditors to reputable auditors, and vice versa. Among the issuing firms that change to reputable auditors from ordinary ones, 52.5% enjoy a decrease in credit spreads, 40% have longer bond maturities, and 50% issue larger bonds. This is indicative that the new hires of reputable auditors have positive impacts on bond terms. In contrast, when issuing firms dismiss reputable auditors, 60% of them have an increase in their credit spreads and 45% of them experience a shortening in bond maturities. These statistics suggest that bondholders seem to punish issuers for switching from reputable auditors to ordinary ones.

Columns (3) and (4) present descriptive statistics for the changes in bond terms due to the changes from ordinary underwriters to reputable ones, and vice versa. For the issuing firms that experience the changes from ordinary to reputable underwriters, 41% of them have longer bond maturities and 52% of them increase bond sizes. The changes in the bond terms concerning issuers' switches from reputable to ordinary underwriters are not very informative of any punishment by bond investors.

We then turn to the multivariate changes analysis to examine the effects of reputable auditors and underwriters on the bond terms. In our OLS regressions, we do not exclude the issuers that have multiple bonds in a given year. In the change regressions, however, to make the changes comparable, we only include the largest bond of an issuer in a given year. Furthermore, we also eliminate bonds in the year of changes of reputable auditors/underwriters because it is unclear whether they were issued before or after the auditor/underwriter changes. Finally, we halve the full-change sample as follows: The first sample consists of issuing firms that switch from ordinary auditors to reputable auditors and those that do not change auditors (Δ*Reputable Auditor* = 1 *or* 0) and the second sample consists of issuing firms that change from reputable auditors to ordinary auditors and those that do not change auditors (Δ*Reputable Auditor* = -1 *or* 0). Both samples use issuing firms that do not change auditors as the comparison group.[15] Such separation allows us to determine whether the univariate evidence in Panel A holds in the multivariate framework. We include the change in reputable underwriters in both regressions.

Panel B of Table 6 presents the multivariate regression results for the first sample. Interestingly, the coefficient estimate of Δ *Reputable Auditor* in the regression of credit spread is negative, but not statistically significant, implying that bondholders do not react to switches from ordinary to reputable auditors strongly, although this might also be due to the limited power because we do not have many reputable auditor switches in the sample. Panel C of Table 6 displays the multivariate regression results for the second sample. The coefficient estimate of Δ *Reputable Auditor* with respect to credit spread is negative and statistically significant at 10%, indicating that the change from reputable auditors to

Table 6. Changes Analysis

Panel A: Description of changes in reputable auditor and underwriters

		Switch to reputable auditors (1)	Switch to ordinary auditors (2)	Switch to reputable underwriters (3)	Switch to ordinary underwriters (4)
Credit Spread	↑	19 (47.5%)	12 (60%)	58 (45%)	19 (48.7%)
	=	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	↓	21 (52.5%)	8 (40%)	71 (55%)	20 (51.3%)
Maturity	↑	16 (40.0%)	8 (40%)	53 (41%)	16 (41%)
	=	13 (32.5%)	3 (15%)	38 (29.5%)	15 (38%)
	↓	11 (27.5%)	9 (45%)	38 (29.5%)	8 (21%)
Bond Size	↑	20 (50.0%)	15 (75%)	67 (52%)	20 (51%)
	=	6 (15.0%)	1 (5%)	20 (15.5%)	3 (8%)
	↓	14 (35.0%)	4 (20%)	42 (32.5%)	16 (41%)
n		40	20	129	39

Panel B: ΔReputable auditor = 1 or 0

	Credit Spread		*Maturity*		*Bond Size*	
	Coefficient	*t* statistic	Coefficient	*t* statistic	Coefficient	*t* statistic
Δ*Reputable Auditor*	−0.02	−0.09	1.99	0.85	−0.337**	−2.36
Δ*Reputable Underwriter*	0.04	0.30	−0.62	−0.55	−0.005	−0.08
Δ*Leverage*	1.92**	2.16	−14.26**	−2.13	0.069	0.17
Δ*Firm Size*	0.20	0.94	−3.12*	−1.90	0.525***	5.35
Δ*Tangibility*	−0.02**	−2.28	0.01	0.04	−0.008	−1.42
Δ*ROA*	0.004	0.22	0.09	0.68	−0.008	−0.98
Δ*Maturity*	0.02***	2.90			−0.001	−0.45
Δ*Bond Size*	−0.09	−0.89	−0.35	−0.45		
Δ*No. of Covenants*	0.12***	3.64	−0.20	−0.81	0.098***	6.51

(continued)

Table 6. (continued)

Panel B: ΔReputable auditor = 1 or 0

	Credit Spread		*Maturity*		*Bond Size*	
	Coefficient	*t* statistic	Coefficient	*t* statistic	Coefficient	*t* statistic
Δ*Credit Rating*	0.22***	4.69				
Δ*Credit Spread*			0.82**	2.28	−0.025	−1.14
n	420		420		420	
Adjusted R^2	.13		.01		.16	

Panel C: ΔReputable auditor = −1 or 0

	Credit Spread		*Maturity*		*Bond Size*	
	Coefficient	*t* statistic	Coefficient	*t* statistic	Coefficient	*t* statistic
Δ*Reputable Auditor*	−0.78*	−1.88	2.33	0.74	−0.263	−1.40
Δ*Reputable Underwriter*	0.04	0.27	−0.35	−0.31	−0.092	−1.32
Δ*Leverage*	2.17**	2.43	−13.91**	−2.08	−0.032	−0.08
Δ*Firm Size*	0.47**	2.31	−2.34	−1.52	0.480***	5.37
Δ*Tangibility*	−0.01*	−1.70	−0.004	−0.05	−0.009*	−1.78
Δ*ROA*	0.01	0.36	0.18	1.24	−0.001	−0.19
Δ*Maturity*	0.01**	2.50			−0.001	−0.31
Δ*Bond Size*	−0.06	−0.59	−0.26	−0.31		
Δ*No. of Covenants*	0.11***	3.32	−0.18	−0.71	0.088***	6.00
Δ*Credit Rating*	0.26***	5.39				
Δ*Credit Spread*			0.72**	1.99	−0.022	−1.01
n	400		400		400	
Adjusted R^2	.17		.01		.15	

Note: ROA = return on assets. This table presents the results for changes regressions. Columns (1) to (2) of Panel A presents descriptive statistics of the changes in bond terms after issuing firms switch from ordinary auditors to reputable auditors, or vice versa. Columns (3) to (4) of Panel A present the changes in bond terms that occur after the switches from ordinary underwriters to reputable ones, or vice versa. Panel B presents estimates for the multivariate changes regressions of issuing firms that change from ordinary auditors to reputable auditors and those that do not change auditors. Panel C reports estimates for the multivariate changes regressions of issuing firms that change from reputable auditors to ordinary auditors and those that do not change auditors.

*,**, *** are 10%, 5%, and 1% significance levels, respectively.

ordinary auditors leads to an increase in credit spread. This is consistent with the univariate evidence presented in Panel A, suggesting that bondholders penalize issuing firms that switch from reputable to ordinary auditors. The coefficient estimate of Δ *Reputable Auditor* on bond maturities is positive but not significant, weakly supporting the hypothesis that the presence of reputable auditors and the effect of short-term bonds substitute for each other. In both samples, we do not find any effect for the change in reputable underwriters, mainly because they hardly change when auditors change.

The results in Panel B and C of Table 6 can be explained by bonds' nonlinear payoff structure (Easton, Monahan, & Vasvari, 2009). As holding bonds provides a limited upside, bondholders are less sensitive to good news compared with bad news. This is consistent with our multivariate results that bondholders do not react strongly to switches from ordinary to reputable auditors. However, when there is bad news (i.e., issuing firms change from reputable to ordinary auditors), bondholders react negatively and significantly. Overall, these results largely support our conclusions from the OLS regressions.

We also conduct a multivariate change analysis using samples partitioned based on whether issuing firms change from ordinary underwriters to reputable underwriters, or vice versa. Consistent with the univariate evidence, we do not find informative results for the impact of changes in reputable underwriters on different bond terms. This may be due to the low power of the test given that only a very small number of firms switch underwriters. However, this result is also consistent with our argument that investors place more value on reputable auditors than underwriters because the former play multiple roles as information intermediaries, monitors, and insurance providers. Consequently, investors respond more strongly to the changes in reputable auditors than underwriters.

Rating Groups Analysis

The theory suggests that the certification roles of reputable auditors and underwriters help issuers reduce the information asymmetry that exists between insiders and bondholders. Such an information gap could negatively affect bondholders if insiders use it to their own advantage by diverting wealth to themselves. As a result, one would expect the impact of intermediaries' certification roles to increase in the magnitude of bond risk associated with this information gap. Empirically, we use credit ratings to proxy for bond risk and explore whether the effects of reputable auditors and underwriters are stronger for issues with lower credit ratings. To do so, we partition the full sample into high-investment grade (S&P's rating ''AAA,'' ''AA+,'' and ''AA''), moderate-investment grade (''AA−,'' ''A+,'' and ''A''), low-investment grade (''A−,'' ''BBB+,'' and ''BBB''), and speculative grade (below ''BBB'').

Table 7 presents the results concerning the effects of reputable auditors and reputable underwriters on the bond terms for different rating groups. Consistent with our expectation, the coefficient estimates of reputable auditors on credit spreads become more negative as ratings become lower. The estimates are especially significant and strong for issues with low-investment and speculative grades, implying that the certification role of reputable auditors is more important to the issues with a high bond risk. However, the coefficient estimates of reputable auditors on bond maturities are only statistically significant for issues with high-investment grades, suggesting that reputable auditors can only substitute the ex-postmonitoring role of short-term debt in a low-bond-risk environment. The impact

Table 7. Rating Groups Analysis

Panel A: Rating groups analysis

	Credit Spread				*Maturity*				*Bond Size*			
	High	Moderate	Low	Speculative	High	Moderate	Low	Speculative	High I	Moderate	Low	Speculative
Reputable Auditor	0.01	−0.18	−0.14*	−0.32**	5.66***	−0.22	0.74	−0.27	−1.07***	0.16	0.39**	0.64***
	(0.08)	(−1.63)	(−1.66)	(−2.33)	(3.73)	(−0.19)	(0.69)	(−0.88)	(−3.02)	(0.63)	(2.51)	(4.73)
Reputable Underwriter	0.18	−0.03	−0.15	−0.01	−0.59	−0.96	2.72**	0.13	2.10***	1.68**	0.94***	0.60***
	(1.42)	(−0.35)	(−1.30)	(−0.02)	(−0.54)	(−0.75)	(2.55)	(0.31)	(7.37)	(2.57)	(4.47)	(3.24)
Interaction	0.12	0.04	0.18	−0.05	0.21	1.07	−2.71	1.12	1.06***	−0.24	−0.48*	−0.74***
	(0.62)	(0.34)	(1.23)	(−0.24)	(0.16)	(0.59)	(−1.64)	(1.61)	(2.72)	(−0.36)	(−1.86)	(−3.47)
Tenure	−0.07**	0.01	−0.01	0.01	0.61	−0.07	0.10	0.02	−0.06	0.01	0.04	−0.02
	(−2.28)	(0.80)	(−0.40)	(0.47)	(1.03)	(−0.48)	(0.65)	(0.49)	(−0.50)	(0.22)	(1.40)	(−1.12)
Leverage	0.31	0.18	0.85**	2.04***	21.76***	5.56**	−0.27	−1.41**	0.84	−1.02	−0.93	−1.19***
	(0.54)	(0.75)	(2.00)	(6.54)	(7.45)	(2.01)	(−0.07)	(−2.42)	(0.57)	(−1.64)	(−1.15)	(−3.64)
Firm Size	−0.07	0.09	0.04	−0.23***	0.43	0.70**	0.01	0.06	0.21**	0.13	0.11	0.09
	(−1.43)	(1.63)	(0.93)	(−4.24)	(0.60)	(2.31)	(0.04)	(0.46)	(2.21)	(1.24)	(1.28)	(1.58)
Tangibility	−0.01*	0.01*	0.01**	0.01	−0.22***	−0.01	0.07***	0.01	−0.05*	−0.01	−0.01*	0.01
	(−1.69)	(1.80)	(2.39)	(1.54)	(−2.90)	(−0.77)	(2.96)	(0.87)	(−1.88)	(−0.26)	(−1.95)	(1.29)
ROA	−0.01	−0.02**	0.01	−0.04***	0.01	−0.04	−0.09	0.03*	−0.01	−0.01	−0.01	0.03***
	(−0.38)	(−2.08)	(1.31)	(−4.11)	(0.01)	(−0.55)	(−1.14)	(1.81)	(−0.19)	(−0.68)	(−0.60)	(3.99)
Putable	−0.37	−0.52***	−0.38**	−0.81***	6.59**	19.08***	21.30***	12.72***	−0.84**	0.84	0.11	−0.28
	(−0.49)	(−2.81)	(−2.40)	(−2.90)	(2.47)	(4.22)	(5.58)	(4.16)	(−2.13)	(1.55)	(0.43)	(−0.44)
Callable	0.09	0.24**	0.31***	0.39**	9.63***	9.21***	4.97***	2.32***	0.34***	0.35***	0.35***	−0.26
	(0.80)	(2.37)	(2.92)	(2.45)	10.06	(9.39)	(2.71)	(4.98)	(2.71)	(3.83)	(2.65)	(−1.00)
Sinking Fund	−0.36*	−0.54***	−1.16***	−0.32	−2.71	−1.51	4.79	9.50***	1.54*	1.67***	−0.41	−0.12
	(−1.74)	(−2.97)	(−4.05)	(−0.68)	(−0.52)	(−0.52)	(1.05)	(4.37)	(1.81)	(2.76)	(−0.57)	(−0.18)
Subordinated		−0.03	0.56**	−0.16		5.60	1.13	2.80***		0.02	0.32	1.56***
		(−0.16)	(2.01)	(−0.21)		(0.83)	(0.25)	(2.61)		(0.05)	(0.45)	(2.71)
Maturity	0.02***	0.01*	0.02***	0.01					−0.01	−0.01	0.01	0.06***
	(3.83)	(1.81)	(7.92)	(0.11)					(−1.19)	(−1.14)	(0.89)	(4.18)
Bond Size	−0.02	0.08***	0.02	−0.06*	−0.13	−0.12	0.22	0.57***				
	(−0.59)	(3.11)	(0.72)	(−1.72)	(−1.52)	(−1.12)	(0.99)	(6.42)				

(continued)

Table 7. (continued)

Panel A: Rating groups analysis

	Credit Spread				*Maturity*				*Bond Size*			
	High	Moderate	Low	Speculative	High	Moderate	Low	Speculative	High I	Moderate	Low	Speculative
No. of Covenants	−0.13*	−0.05***	0.01	0.16***	0.14	0.08	0.02	−0.12***	0.32**	0.57***	0.34***	0.16***
	(−1.81)	(−3.06)	(0.05)	(10.67)	(0.42)	(0.44)	(0.09)	(−2.91)	(2.34)	(7.27)	(7.38)	(6.69)
Credit Spread					1.56***	0.26	2.46***	0.01	−0.11	0.16	0.05	−0.06*
					(3.76)	(1.17)	(2.93)	(0.11)	(−0.62)	(1.32)	(0.77)	(−1.80)
Year-Fixed Effects	Yes				Yes				Yes			
Industry-Fixed Effects	Yes				Yes				Yes			
n	1,307	4,504	2,280	1,426	1,307	4,504	2,280	1,426	1,307	4,504	2,280	1,426
Adjusted R^2	.09	.16	.30	0.5	.14	.34	.34	.28	.16	.50	.52	.63

Note: ROA = return on assets. In this table, we partition the full sample into high-investment grade (Standard & Poor's rating "AAA," AA+," and "AA"), moderate-investment grade ("AA−," "A+," and "A"), low-investment grade ("A−," "BBB+," and "BBB"), and speculative grade (below "BBB"). See Appendix A for variable definitions.

***, *** are 10%, 5%, and 1% significance levels, respectively.

of reputable underwriters on bond sizes persists across rating groups, as the coefficient estimates on reputable underwriters are positive and significant in all regressions of rating groups.

Additional Robustness Checks

In untabulated robustness checks, we investigate whether our baseline results remain robust when we use alternative measures of reputable auditors and underwriters. The first set of robustness checks relates to alternative measures of reputable auditors. We designate an auditor as a reputable auditor if its market share is the largest in the industry and exceeds the rest of auditors by at least 15% instead of 10%. As an alternative, we follow prior literature (e.g., Mayhew & Wilkins, 2003) and construct a measure of auditor reputation based on the square root of the assets of the auditor's clients. Finally, we use an alternative industry classification developed by Fama and French (1997) to identify reputable auditors. Our main results are robust to all these measures.

In the second set of sensitivity checks, we find that our results are robust to alternative specifications for the construct that captures the reputation of underwriters. We define reputable underwriters as the top eight underwriters based on market share. We also identify the top five underwriters based on the logarithm of the face value of bond issues they have advised on, as opposed to their market share. Our baseline findings regarding the size of the bond issue continue to remain robust.

Conclusion

In this article, we test the certification hypothesis, which states that capital market intermediaries with reputation capital at stake can provide a certification role that reduces the information asymmetry between firms and investors, and thereby helps firms obtain favorable bond terms. For this certification role to hold, capital market intermediaries must have strong incentives to maintain their reputation through repeated entries into the capital markets.

We empirically show that reputable auditors and underwriters indeed satisfy this requirement and play an important role in bridging firms that need to raise bonds and investors that seek bond risk premiums. Reputable auditors and underwriters not only assist bond issuers in obtaining lower bond yields but also help issuers borrow more and for longer periods. Taken together, our results provide a more complete picture of how different capital market intermediaries affect the pricing and nonpricing terms of bonds. Furthermore, the nature of reputable auditors' and underwriters' job responsibilities determines the different magnitudes and ways in which they provide benefits for the issuing firms.

Appendix A Variable Definitions

Variable	Definition	Source
Reputable Auditor	Indicator variable equal to 1 if a firm hires reputable auditor, and 0 otherwise	Compustat
Tenure	The length of the auditor–client relationship	Compustat
Leverage	Long-term debt divided by total asset	Compustat
Tangibility	Net property, plant, and equipment scaled by total assets	Compustat
ROA	Operating income divided by total assets	Compustat
Firm Size	The natural logarithm of total assets	Compustat
Reputable Underwriter	Indicator variable equal to 1 if an issue is underwritten by a reputable underwriter, and 0 otherwise	FISD
Credit Spread	The difference between a bond issue's offering yield and the yield of a benchmark treasury issue	FISD
Credit Rating	Numeric values assigned to bond ratings offered by S&P's or Moody's, ranging from 1 to 20	FISD
Speculative Grade	Indicator variable equal to 1 if an issue is rated below BBB by S&P's or Moody's, and 0 otherwise	FISD
Maturity	An issue's maturity date minus its offering date in years	FISD
Bond Size	The natural logarithm of an issue's offering amount	FISD
Callable	Indicator variable equal to 1 if an issue has a call option, and 0 otherwise	FISD
Putable	Indicator variable equal to 1 if an issue has a put option, and 0 otherwise	FISD
Sinking Fund	Indicator variable equal to 1 if an issue has the sinking fund feature, and 0 otherwise	FISD
Subordinated	Indicator variable equal to 1 if an issue is subordinated, and 0 otherwise	FISD
No. of Covenants	The number of covenants included in an issue	FISD

Note: BBB = Better Business Bureau; S&P = Standard & Poor's; ROA = return on assets; FISD = Fixed Income Securities Database.

Appendix B Reputable Auditors by Industry

Two-digit SIC	Reputable Auditors
13	PWC (1995-2006)
15	Arthur Anderson (1995-1998); Ernst and Young (1999-2006)
17	Arthur Anderson (1995-2006)
20	Ernst and Young (1995-2006)
22	Ernst and Young (1995-2006)
23	Ernst and Young (1995-2005); Deloitte and Touche (2006)
24	Arthur Anderson (1995-2004); KPMG (2005-2006)
25	PWC (1995-2006)
26	Arthur Anderson (1995-2001); PWC (2002-2006)
28	PWC (1995-2006)
29	PWC (1995-2006)
30	PWC (1995-2006)
31	Ernst and Young (1995-2006)
33	PWC (1995-2006)
34	PWC (1995-2006)
35	PWC (1995-2006)
36	KPMG (1995-2006)
37	Deloitte and Touche (1995-2000); PWC (2002-2006)
38	PWC (1995-2006)
39	PWC (1995-2006)
40	PWC (1995-2006)
42	Ernst and Young (1995-2005); Deloitte and Touche (2006)
44	PWC (1995-2006)
45	Ernst and Young (1995-2006)
48	PWC (1995-2000); Ernst and Young (2001-2006)
49	Arthur Anderson (1995-2000); Deloitte and Touche (2001-2006)
50	Deloitte and Touche (1995-2006)
51	Arthur Anderson (1995-2001); Ernst and Young (2002-2006)
53	Ernst and Young (1995-2006)
54	Deloitte and Touche (1995-2006)
55	Arthur Anderson (1995-2001); Deloitte and Touche (2002-2006)
56	Deloitte and Touche (1995-2006)
61	KPMG (1995-2006)
62	Deloitte and Touche (1995-2006)
63	PWC (1995-2006)
67	Ernst and Young (1995-2006)
70	Arthur Anderson (1995-2001); Ernst and Young (2002-2006)
72	PWC (1995-2006)
73	PWC (1995-2006)
75	KPMG (1995-2006)
78	Ernst and Young (1995-2006)
79	Arthur Anderson (1995-2001); Deloitte and Touche (2002-2006)
80	Ernst and Young (1995-2006)
87	PWC (1995-2006)

Note: SIC = Standard Industry Classification.
Obtained from Compustat.

Appendix C Reputable Underwriters by Year

Year	Reputable Underwriter
1996	JP Morgan, Bank of America Merrill Lynch, Credit Suisse, Citi, and Barclays Capital
1997	JP Morgan, Bank of America Merrill Lynch, Citi, Credit Suisse, and Morgan Stanley
1998	Bank of America Merrill Lynch, JP Morgan, Credit Suisse, Citi, and Morgan Stanley
1999	JP Morgan, Bank of America Merrill Lynch, Credit Suisse, Citi, and Barclays Capital
2000	JP Morgan, Bank of America Merrill Lynch, Citi, Credit Suisse, and Morgan Stanley
2001	JP Morgan, Citi, Bank of America Merrill Lynch, Credit Suisse, and Barclays Capital
2002	JP Morgan, Bank of America Merrill Lynch, Citi, Barclays Capital, and Credit Suisse
2003	JP Morgan, Bank of America Merrill Lynch, Citi, Barclays Capital, and Morgan Stanley
2004	JP Morgan, Bank of America Merrill Lynch, Citi, Barclays Capital, and Morgan Stanley
2005	JP Morgan, Bank of America Merrill Lynch, Barclays Capital, Citi, and Credit Suisse
2006	JP Morgan, Bank of America Merrill Lynch, Barclays Capital, Citi, and Goldman Sachs & Co

Note: SIC = Obtained from Mergent Fixed Income Securities Database (FISD).

Acknowledgment

The authors thank an anonymous referee, Partha Mohanram, Lakshmanan Shivakumar, Ane Tamayo, Ira Solomon, and other seminar participants at London Business School, University of Oulu, London Business School Trans-Atlantic Doctoral Conference 2009, Auditing Section of AAA Meeting 2010, EAA 2010, and CAAA 2011 for helpful comments and suggestions. Florin Vasvari thanks Audit Integrity for providing the Accounting and Governance Risk Ratings.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Florin Vasvari acknowledges the support of the London Business School RAMD Fund.

Notes

1. Bessembinder and Maxwell (2008) provide statistics that U.S. firms issued US$4.6 trillion in corporate bonds during the period 1997-2006, which is approximately 3 times more than the amount of equity issued over the same period.
2. In the wake of the Arthur Andersen scandal, the Sarbanes-Oxley Act passed in 2002 effectively made auditors more accountable for errors under a structure of expanded duties and heightened scrutiny.
3. Research by De Franco, Vasvari, and Wittenberg-Moerman (2009) documents that research coverage by sell-side bond analysts working for underwriters is very limited.
4. Covenants are also important contractual features that deal with agency costs. Although the Mergent Fixed Income Securities Database (FISD) provides data on the presence of covenants, it does not document the details of covenants. To the extent that only the details of covenants can capture their true restrictiveness, we do not examine the impact of reputable auditors and underwriters on covenant strictness in this article. We do, however, use the number of covenants as a control variable in our tests.

5. For example, Pittman and Fortin (2004) look at the role of Big Auditors in reducing the interest rate for firms that have become public. Mansi et al. (2004) examine the influence of Big Auditors and auditors' tenure on credit spreads and find that auditor quality and tenure are negatively and significantly related to credit spreads. In addition, Ahmed et al. (2008) study the impact of industry audit specialists on credit ratings.
6. In 2002, Arthur Andersen was convicted of obstruction of justice for providing faulty audits of Enron. As a result, the accounting firm paid US$ 72.5 million to Enron investors as compensation and ultimately surrendered its licenses and was no longer able to practice as Certified Public Accountants in the United States.
7. Academic researchers use various industry classifications to divide firms into homogeneous groups for the purpose of their analyses (e.g., Bhojraj, Charles, Lee, & Oler, 2003). Although not all industry groupings suit our analysis, we also use a well-accepted alternative industry classification developed by Fama and French (1997) in robustness checks (see section titled ''Sensitivity Analyses and Additional Tests'').
8. We use the Accounting and Governance Risk (AGR) rating provided by Audit Integrity in our validity test. The AGR rating is a comprehensive measure of the risk associated with a public firm's accounting and governance practices. High AGR scores imply low accounting and governance risks. In unreported tables, we show that the presence of industry audit specialists is associated with a low AGR score, consistent with the notion that industry audit specialists are related to high accounting and governance quality.
9. A potential explanation for this finding is that bank relationships in the loan market provide the underwriters an informational advantage in the bond market.
10. Market share has been used frequently in the finance literature as an empirical proxy for reputation. See, for example, Simon (1990), De Long (1991), Megginson and Weiss (1991), and Beatty and Welch (1996).
11. Examples of expenses associated with debt issuance are underwriting fees, advertising costs, and brokerage cost. Moreover, besides amortization of expenses associated with debt issuance, there are also other items included in the interest expense filed from Compustat that have nothing to do with the cost of debt, such as interest expense associated with deferred compensation and tax settlements, factoring charges, and so on.
12. Appendix B lists the names of reputable auditors by industry.
13. For example, if a bond issue has a rating of AAA by Moody's or S&P's, the value of the variable *Credit Rating* is 1, whereas if a bond issue is rated BAA, its value is 9. The earliest rating for a bond issue is taken whenever available in the Mergent FISD; if not, the second most recent rating or the average rating of the issue is used instead.
14. According to Li and Prabhala (2007), this type of selection model does not strictly require exogenous instruments. Nevertheless, we also estimate the first stage models by using two instruments, the percentage of firms in an industry that hire a reputable auditor or underwriter and the results remain very robust. Minnis (2011) provides a discussion about the appropriateness of such instruments computed at the industry level.
15. We thank the referee for suggesting this research design.

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